

Application Number 09/995,175

Responsive to Office Action mailed May 5, 2004

REMARKS

This amendment is responsive to the Office Action dated May 5, 2004. Applicant has amended claims 1-7, 10-31 and 34, canceled claims 8-9 and added new claims 36-38. Claims 1-7 and 10-38 are now pending.

In the Office Action, the Examiner rejected claims 1-5, 7-8, 10-21, and 24-30 under 35 U.S.C. 102(b) as being anticipated by Tran et al. (US 6,134,070) (hereafter Tran); rejected claims 6, 9 and 22-23 under 35 U.S.C. 103(a) as being unpatentable over Tran in view of Behr (US 5,055,951) (hereafter Behr); and rejected claims 31-35 under 35 U.S.C. 103(a) as being unpatentable over Beck et al. (US 6,700,729) (hereafter Beck) in view of Tran.

Applicant respectfully traverses the rejections to the extent such rejections may be considered applicable to the claims, as amended. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention.

In order to expedite the prosecution of this application toward issuance, Applicant has amended the claims to clarify the invention. All pending claims specify that the medium is recorded with at least one amplitude-based servo pattern and at least one time-based servo pattern. Moreover, all pending claims now clarify that the amplitude-based servo pattern includes servo windows and edges of the servo windows define servo tracks of the amplitude-based servo pattern, and that the time-based servo pattern includes a first pulse and a second pulse wherein at least a portion of the first pulse defines a different slant angle than a corresponding portion of the second pulse, the slant angles of the first and second pulses being defined relative to a vertical transverse direction across a width of the medium. Nothing in the applied references discloses or suggests this combination of features.

Independent claim 1 is directed to a servopositioning system including a linear data storage medium that includes both time-based and amplitude-based servo patterns, as outlined above, and circuitry separately responsive to the time-based and amplitude-based servo patterns. Independent claim 17 is directed to a method comprising writing time-based and amplitude-based servo patterns to a linear data recording medium, wherein the amplitude-based servo pattern includes servo windows and edges of the servo windows define servo tracks of the amplitude-based servo pattern, and wherein the time-based servo pattern includes a first pulse

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and a second pulse, wherein at least a portion of the first pulse defines a different slant angle than a corresponding portion of the second pulse, the slant angles being defined relative to a vertical transverse direction across a width of the medium.

None of the applied references discloses or suggests a medium that includes both time-based and amplitude-based servo patterns, particularly as specifically recited in the amended claims. Moreover, none of the applied references discloses or suggests the claimed methods, systems, servo writing heads, or data read-while-write heads designed for both time-based and amplitude-based servo patterns. For this reason, all pending claims should be allowed.

In the Office Action, the Examiner rejected claim 1 as being anticipated by Tran. The Examiner stated that Tran discloses a medium that includes both time-based and amplitude-based servo patterns. Applicant respectfully submits, however, that Tran lacks any suggestion of time-based servo patterns, and is directed solely toward conventional media that include amplitude-based patterns. For this reason, Applicant believes that the rejection of claim 1 was improper.

Nevertheless, in the interest of expediting prosecution of this application toward issuance, Applicant has amended independent claim 1 to clarify the structure of the amplitude-based servo patterns and the time-based servo patterns. With respect to the claimed time-based servo pattern, claim 1 now specifies that the time-based pattern includes a first pulse and a second pulse wherein at least a portion of the first pulse defines a different slant angle than a corresponding portion of the second pulse, the slant angles being defined relative to a vertical transverse direction across a width of the medium.

The Examiner cited column 5, lines 45-67, column 18, lines 23-65, and FIGS. 5A-6 of Tran as disclosing time-based servo patterns. In these passages, Tran describes phase encoding of amplitude-based servo blocks. Applicant respectfully submits, however, that the phase encoding described in Tran does not amount to a time-based servo pattern. Instead, the pattern of Tran is merely an amplitude-based pattern that may be encoded with additional information, e.g., defining the linear position along the medium. In short, the phase encoding of amplitude-based blocks, described in Tran, does not amount to a time-based servo pattern, as required by Applicant's claims.

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Furthermore, the amendments to the claims should clarify the distinction between Applicant's claimed invention and the teaching of Tran. Claim 1 now specifies that the time-based pattern includes a first pulse and a second pulse wherein at least a portion of the first pulse defines a different slant angle than a corresponding portion of the second pulse, the slant angles being defined relative to a vertical transverse direction across a width of the medium. Nothing in Tran discloses or suggests such a time-based pattern, and specifically, the phase-based encoding described in Tran does not amount to pulses having different slant angles. Moreover, nothing in any of the applied references discloses or suggests the use of both time-based and amplitude-based servo patterns on a linear data recording medium, as recited in claim 1, particularly with the specific structure of the patterns being further defined as provided in this amendment. Applicant believes that claim 1 and the respective dependent claims should now be in condition for allowance.

As mentioned above, independent method claim 17 was also rejected by the Examiner under 35 U.S.C. 102(a) as being anticipated by Tran. Independent method claim 17 has now been amended to specify that the amplitude-based servo pattern includes servo windows and edges of the servo windows define servo tracks of the amplitude-based servo pattern, and wherein the time-based servo pattern includes a first pulse and a second pulse wherein at least a portion of the first pulse defines a different slant angle than a corresponding portion of the second pulse, the slant angles being defined relative to a vertical transverse direction across a width of a medium recorded by the head. Applicant believes that claim 17 should now be in condition for allowance for the reasons addressed above in relation to independent claim 1.

Independent claim 31 is directed to a magnetic data read-while-write head, comprising two pairs of oppositely arranged time-based servo reading gaps and amplitude-based servo reading gaps that are larger than the time-based servo reading gaps. Moreover, independent claim 31 also recites matched thin film magnetoresistive data read/write gaps between the pairs of oppositely arranged servo reading gaps. Claim 31 has been amended to clarify that the amplitude-based reading gaps read from a magnetic medium an amplitude-based servo pattern including servo windows with edges that define servo tracks of the amplitude-based servo pattern, and wherein the time-based servo reading gaps read a time based servo pattern including a first pulse and a second pulse wherein at least a portion of the first pulse defines a different

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slant angle than a corresponding portion of the second pulse, the slant angles being defined relative to a vertical transverse direction.

Independent claim 34 recites a servo writing head comprising at least one set of time-based servo writing gaps arranged at a slant angle and at least one set of amplitude-based servo writing gaps. As claimed, the head is configured so that the head can simultaneously write pulses for a time-based servo pattern and erase windows for an amplitude-based servo pattern, wherein the amplitude-based servo pattern includes servo windows and edges of the servo windows define servo tracks of the amplitude-based servo pattern, and wherein the time-based servo pattern includes a first pulse and a second pulse wherein at least a portion of the first pulse defines a different slant angle than a corresponding portion of the second pulse, the slant angles being defined relative to a vertical transverse direction across a width of a medium recorded by the head.

The Examiner rejected independent claims 31 and 34 as being obvious over Beck in view of Tran. The Examiner stated that Beck discloses a read-while-write head that includes the features of Applicant's claim 31. Contrary to the Examiner's interpretation, however, Beck does not disclose or suggest two pairs of oppositely arranged time-based servo reading gaps and amplitude-based servo reading gaps that are larger than the time-based servo reading gaps. Specifically, element 31 (relied upon by the Examiner) is neither an amplitude-based servo reading gap, nor is it larger than the time-based servo reading gaps. Thus, Applicant respectfully submits that the Examiner has misinterpreted the teaching of Beck with respect to the features of Applicant's claims. Element 31 is an alignment element that is used to define an alignment band on the medium for write elements 41, which appear to be gaps for creating conventional time-based marks. Beck lacks any suggestion whatsoever of amplitude-based servo reading gaps that are larger than the time-based servo reading gaps, as claimed.

In rejecting claim 31, the Examiner indicated that Beck teaches matched thin film magnetoresistive data read/write gaps between the pairs of oppositely arranged servo reading gaps in FIG. 18B and column 10, lines 5-10, column 14, lines 26-35 and column 19, lines 36-39. These passages, however, lack any suggestion of Applicant's claimed invention. Specifically, FIG. 18B lacks any teaching of amplitude-based servo reading gaps, as claimed. Column 10,

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lines 5-10, of Beck merely indicates that photolithography may be used to create the write elements 41.

In column 14, lines 26-35 and FIG. 18B (cited by the Examiner), Beck describes a head 70 that includes data elements 81 between two pairs of oppositely arranged servo reading gaps 91 as recited in claim 31, but this head of Beck lacks any suggestion of amplitude-based servo reading gaps, as further recited in claim 31. Notably, the amplitude-based servo reading gaps recited in claim 31 are required to be larger than the time-based servo reading gaps. However, Beck does not even disclose amplitude-based servo reading gaps, much less amplitude-based servo reading gaps larger than the time-based servo reading gaps, as recited in claim 31.

Column 19, lines 36-39 (also cited by the Examiner) merely identifies conventional closed-loop servo heads, thin film magnetoresistive heads and thin-film magnetoresistive servo write heads. This passage, however, lacks any suggestion of time-based servo reading gaps and amplitude-based servo reading gaps, as recited in claim 31. Again, Beck does not even disclose amplitude-based servo reading gaps, much less amplitude-based servo reading gaps larger than the time-based servo reading gaps, as recited in claim 31.

Moreover, nothing in Beck discloses or suggests the features of claim 34 which require time-based servo writing gaps arranged at a slant angle and at least one set of amplitude-based servo writing gaps, configured so that the head can simultaneously write pulses for a time-based servopositioning pattern and erase windows for an amplitude-based servo pattern. As mentioned, claim 34 has also been amended to clarify that the amplitude-based servo pattern includes servo windows and edges of the servo windows define servo tracks of the amplitude-based servo pattern, and wherein the time-based servo pattern includes a first pulse and a second pulse wherein at least a portion of the first pulse defines a different slant angle than a corresponding portion of the second pulse, the slant angles being defined relative to a vertical transverse direction across a width of a medium recorded by the head. Beck simply lacks any suggestion of a head that includes elements for creating both time-based and amplitude-based servo patterns, particularly as recited in claim 34.

New independent claim 36 recites a magnetic tape comprising an amplitude-based servo pattern including servo windows, wherein edges of the servo windows define servo tracks of the amplitude-based servo pattern, and a time-based servo pattern, wherein the time-based servo

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pattern includes a first pulse and a second pulse wherein at least a portion of the first pulse defines a different slant angle than a corresponding portion of the second pulse, the slant angles being defined relative to a vertical transverse direction across a width of the tape. New independent claim 36 should be in condition for immediate allowance for the reasons identified above with respect to claims 1 and 17.

In summary, Applicant has amended all pending claims to clarify that the medium is recorded with at least one amplitude-based servo pattern, and at least one time-based servo pattern. Moreover, all pending claims now clarify that the amplitude-based servo pattern includes servo windows and edges of the servo windows define servo tracks of the amplitude-based servo pattern, and that the time-based servo pattern includes a first pulse and a second pulse wherein at least a portion of the first pulse defines a different slant angle than a corresponding portion of the second pulse, the slant angles of the first and second pulses being defined relative to a vertical transverse direction across a width of the medium. Nothing in the applied references discloses or suggests this combination of features.

In particular, none of the applied references discloses or suggests a medium that includes both time-based and amplitude-based servo patterns, particularly as specifically recited in the amended claims. Moreover, none of the applied references discloses or suggests the claimed methods, systems, servo writing heads, or data read-while-write heads designed for both time-based and amplitude-based servo patterns. For this reason, all pending claims should be allowed.

In this response, Applicant has focused on the features of the independent claims, which are lacking from the prior art. With regard to the dependent claims, however, Applicant in no way acquiesces to the Examiner's rejections. Applicant reserves the right to further address the features recited in the dependent claims at a later date.

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In view of the forgoing comments and the amendments to the claims, Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 09-0069. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date:

7/27/4

Imation Legal Affairs

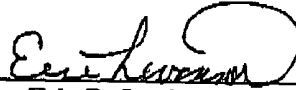
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